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AUTHORITY		DATE
Ken Vorndran (original signature on file)	IMS Representative	08/28/2014

REFERENCES	
Document ID/Link	Title
IVV all	All IMS Documents
NPD 1000.3	The NASA Organization
NPD 1280.1	NASA Integrated Management System Policy
NPR 1441.1	NASA Records Retention Schedules
ISO 9001:2008	International Organization for Standardization: Quality Management Systems Requirements
http://acquisition.gov/comp/far/index.html	Federal Acquisition Regulation (FAR)
http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm	NASA FAR Supplement (NFS)

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1.0 Purpose

This document defines the manner in which the NASA IV&V Program implements the NASA IV&V Management System (IMS) as a quality management system.

The IMS is designed to meet the requirements of the International Organization for Standardization (ISO) 9001:2008 Standard.

2.0 Scope


This document applies to the work performed under the scope of the NASA IV&V Program's ISO certification:

- Independent Software Verification and Validation
- System Software Assessments
- Systems and Software Engineering Research
- Software Support for the Office of Safety and Mission Assurance (OSMA)

This scope encompasses all of the work activities performed by the NASA IV&V Program and documented in the IMS. The IMS is the core of the NASA IV&V Program's effort to uphold its vision and mission statements.

Understanding the key elements of the NASA IV&V Program's mission helps employees to advance that mission across several primary areas of focus, known as functional organizations. Individually and collectively, these functional organizations generate the methods for meeting the Goals and Outcomes identified in the IV&V Program Strategic Plan

(<https://ecmles.faircon.net/livelink/livelink/open/3761653>).

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The following chart depicts the organizational structure for the NASA IV&V Program.

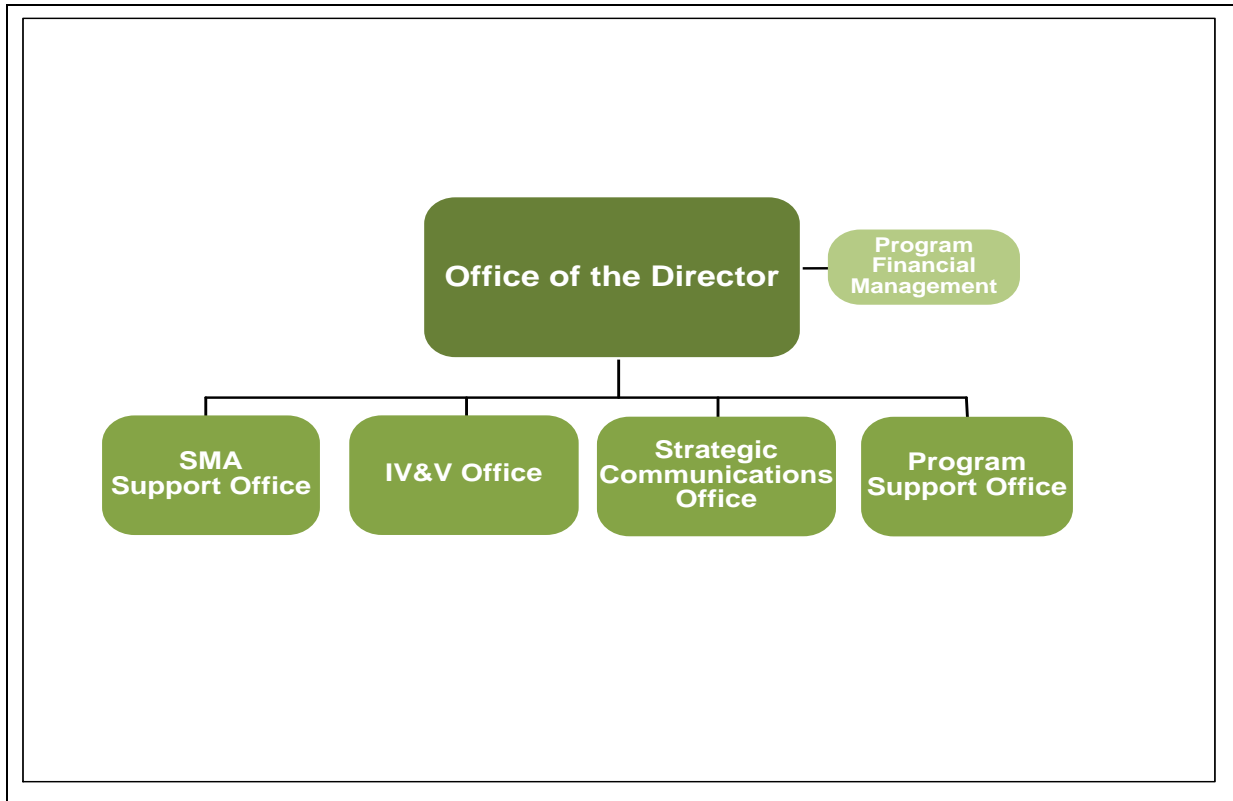



Figure 1 – NASA IV&V Program Organization

3.0 IV&V Management System

3.1 General

The IMS contains documents that have been developed to standardize the planning, performance, control, and measurement of NASA IV&V operation. The IMS shall encompass the activities that affect the products and services that the NASA IV&V Program provides to customers. The NASA IV&V Program practices continuous improvement in its refinement and enhancement of IMS processes. The IMS is documented and structured in the following manner:

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3.2 IMS Documentation

The following depicts the IMS documentation structure.

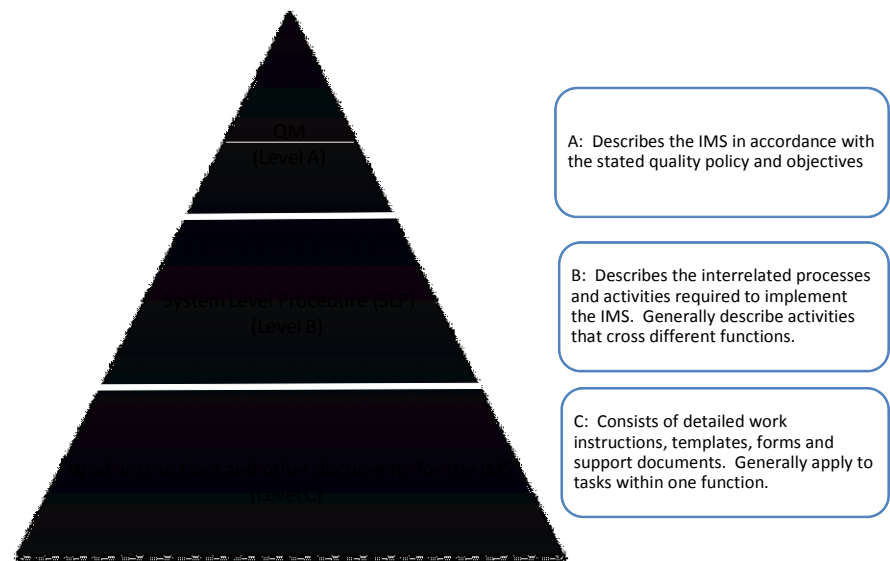



Figure 2 – IMS Documentation Structure

The ISO 9001:2008 Standard mandates that all quality management systems shall address six required areas:

- Control of Documents
- Control of Records
- Internal Audits
- Control of Nonconforming Product
- Corrective Action
- Preventive Action

These six required areas are fully addressed by the IMS. For a graphical depiction of the ISO 9001:2008 Standard requirements applied to the IMS documents and functional organizations, see [ISO-IMS Mapping Diagram](#). Note: Section 7.6 (of the ISO 9001:2008 Standard), *Control of monitoring and measuring equipment*, is excluded, because equipment is not used by the IV&V Program to provide evidence of conformity of product to

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determined requirements. No impact to IV&V Program services or products is anticipated as a result of this exclusion. For the relationships between IMS documents, see the [Reference Mapping Diagram](#).

The [IMS Documentation Master List](#) on the [IMS web site](#) provides a current representation of all IMS documents, Process Owners (POs), and revision information.

To ensure continuous improvement, every IMS document is reviewed on an annual basis for currency, accuracy, and applicability to the NASA IV&V Program.

4.0 Management Responsibility

4.1 Management Commitment

IV&V Program Management is committed to the development, implementation, and continual improvement of the effectiveness of the IMS as evidenced by:


- Communication to IV&V staff of the expectations and importance of meeting or exceeding customer requirements and enhancing customer satisfaction.
- Establishing the Quality Policy.
- Conducting Management Reviews.
- Ensuring the availability of resources.
- Ensuring the establishment of and measurement of progress toward meeting the IV&V Program Strategic Plan, which includes the Program Vision and Mission.

4.1.1 Vision

Be a world leader in systems and software engineering that enables our customers' success.

4.1.2 Mission

To provide our customers assurance that their safety and mission-critical software will operate reliably and safely and to advance the systems and software engineering disciplines. In doing so, we


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work to standards of excellence, provide professional engineers, provide national and global leadership, focus on customer satisfaction, and adhere to and demonstrate our core set of values: safety, integrity, respect, teamwork, balance, innovation, and excellence.

4.2 Quality Policy

The Quality Policy of the NASA IV&V Program is to:

“Provide superior quality products and services, through continuous improvement, that meet or exceed customer requirements. This will be accomplished by developing and operating a comprehensive, coordinated quality management system that ensures the continual improvement of the effectiveness and efficiency of our processes. These quality processes ensure that quality products and services are provided by the NASA IV&V Program.”

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4.3 Quality Objectives

The NASA IV&V Program has established a Strategic Plan that includes the Program Vision, Program Mission, Strategic Goals, and Outcomes related to each Goal. Each government fiscal year, each of the functional organizations with the IV&V Program produces an Office Execution Plan (OEP). The Outcomes from the Strategic Plan are the primary driver for OEPs, and serve the role of quality objectives for the Program. The IV&V Program Strategic Plan is pictured below and can be found here: (<https://ecmles.faircon.net/livmlink/livmlink/open/3761653>).

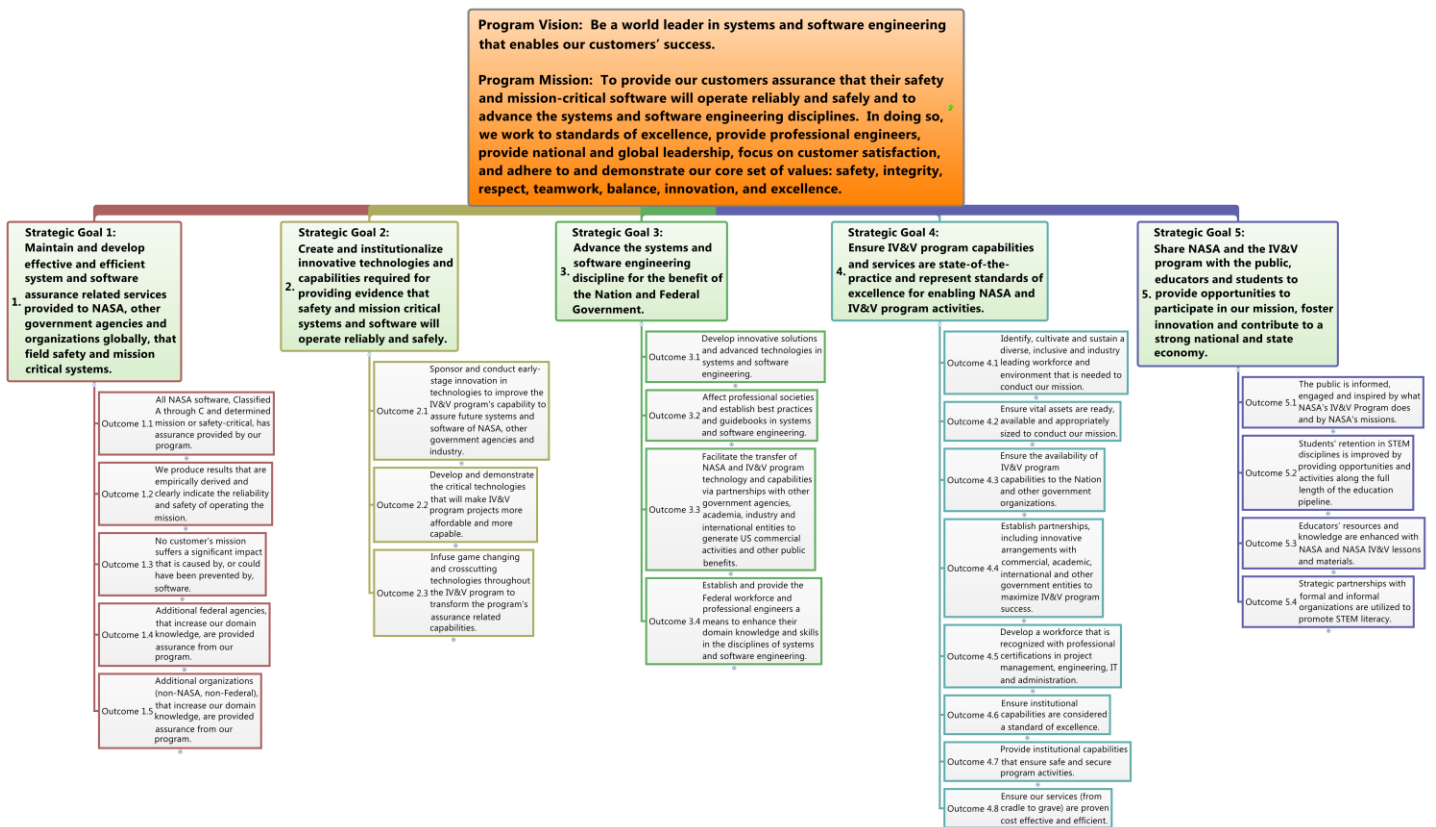


Figure 3 – NASA IV&V Program Strategic Plan

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The OEPs are developed and executed in accordance with the model demonstrated in the following diagram.

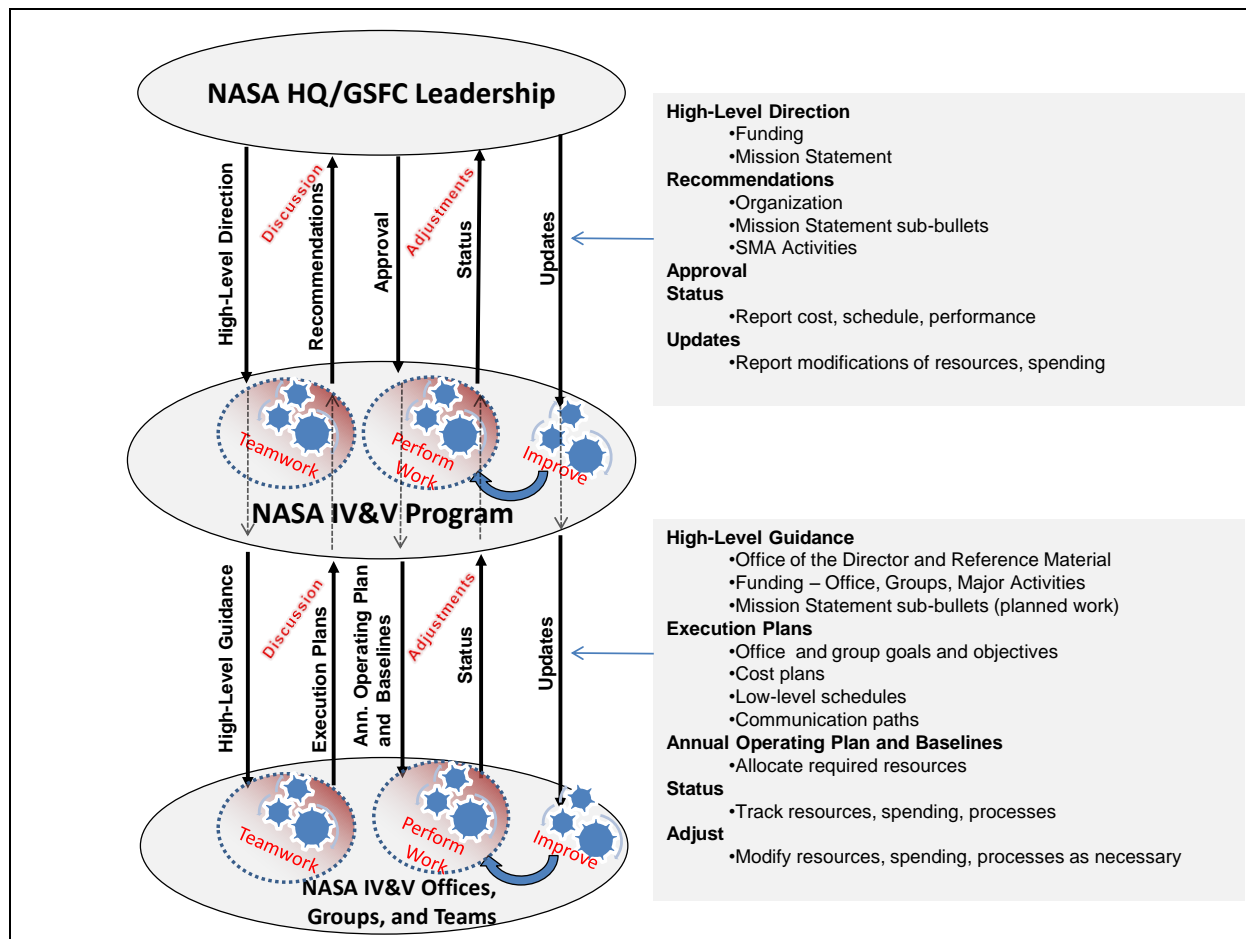



Figure 4 – NASA IV&V Execution Plan Model

Checks and balances among the NASA IV&V Program, NASA HQ/GSFC, and NASA IV&V Offices ensure that the Program as a whole receives the high-level direction it needs to carry out its Mission, while also ensuring that the Offices receive the high-level guidance necessary to establish and execute their OEPs.

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4.4 Organization, Responsibility, Authority

4.4.1 Organization

The NASA IV&V Program is a NASA Program established in accordance with NPD 1000.3, *The NASA Organization*. The NASA IV&V Program functions operationally under the guidance of the Chief of the OSMA while receiving administrative support from GSFC. The NASA IV&V Director is a NASA HQ employee who serves as the NASA IV&V Program Manager and reports directly to the Chief of the OSMA.


The IV&V Board of Advisors (IBA) is a NASA-level board chaired by the Chief of the OSMA. It is comprised of advisors representing each Mission Directorate Associate Administrator (AA), the Chief Information Officer (CIO), the Chief Engineer, the GSFC Director, and the NASA IV&V Program Director. The IBA's purpose is to advise the Chief of the OSMA on the funding requirement and allocation of IV&V services among NASA's programs and projects on an annual basis.

Please refer to the [GSFC Organizations webpage](#) for the most current representation of Code 100, and [OSMA Organization webpage](#) for the most current representation of the OSMA.

4.4.2 Responsibility and Authority

The NASA IV&V Director, Senior Leadership, and employees ensure that the IMS is effective in assuring quality of products and services that exceed customer requirements.

Program Management (i.e., the NASA IV&V Director, Deputy Director, and Associate Director) shall ensure that quality objectives are established, measured, reported, and associated with metrics to ensure quality and process effectiveness are incorporated into the NASA IV&V Metrics Program.

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4.4.3 Management Review

Each quarter, Metric Owners shall collect and analyze their metrics and report their analysis to Program Management at the Quarterly Management Review (QMR).

The QMR is one method that the NASA IV&V Program uses to continuously improve products, processes, and quality management methods that demonstrate the suitability, adequacy, and effectiveness of the IMS. Customer feedback, internal audits, and external audits are other methods of measuring the NASA IV&V Program's success and attaining continuous improvement.

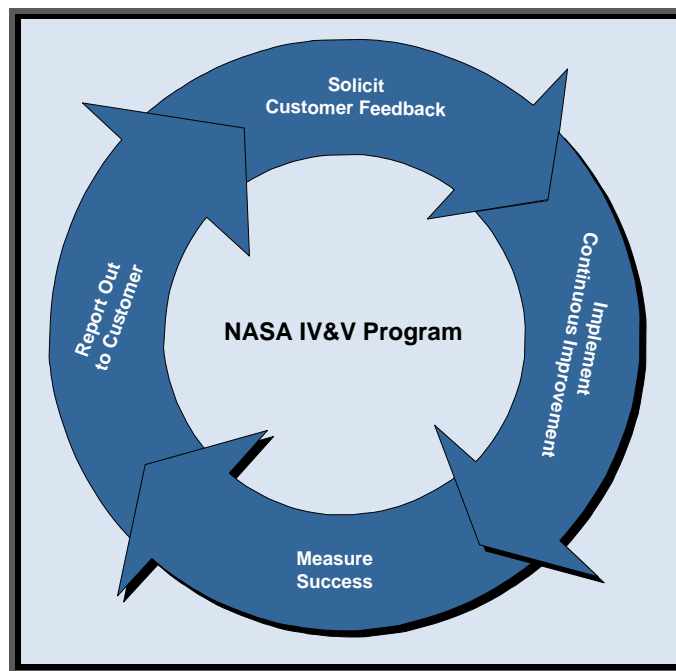



Figure 5 – NASA IV&V Process for Customer Feedback

This process of receiving input from and reporting out to customers allows the NASA IV&V Program to augment its continuous improvement efforts.

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5.0 Appendices


The following appendices contain content maintained in separate documents. Follow the links provided to view the documents.

Appendix A – Acronyms and Definitions


<http://www.nasa.gov/centers/ivv/ims/slps/index.html>

Appendix B – Responsibilities and Authorities

<http://www.nasa.gov/centers/ivv/ims/slps/index.html>

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VERSION HISTORY				
Version	Description of Change	Rationale for Change	Author	Effective Date
Basic	Initial release to replace Ames QM		Siamak Yassini IT/332	09/09/1999
A – H	Revision information older than 7-year retention period relocated to Revision History Overflow Document		Various	05/07/2001 – 01/24/2006
I	Updated content; moved appendix material to separate documents		Stephanie Ferguson	10/10/2007
J	Updated Vision, Quality Policy, and document references; updated terms and definitions resulting from re-engineering process		Stephanie Ferguson	04/08/2008
K	Updated terminology to reflect the current organizational structure and to meet the ISO 9001:2008 Standard		Stephanie Ferguson	07/14/2009
L	Updated to reflect new organizational structure		Stephanie Ferguson	07/13/2010
M	Revised information on PEP; added execution plan process diagram		Greg Blaney	08/31/2010

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VERSION HISTORY				
Version	Description of Change	Rationale for Change	Author	Effective Date
N	Updated the Quality Policy, Leadership direction and Quality Objectives. Sections 1.2, 1.2.1, 1.2.2, and 1.3 are affected. Added IVV 09-9 to section 4.3. Added IVV 03 and IVV 26 to section 4.5.		Greg Blaney	11/24/2010
O	Updated Knowledge Management and KM roles, Public Affairs, etc.	Updated to accurately reflect updated roles and organizational changes	Natalie Alvaro	10/24/2011
P	Updated vision/mission, add description of Strategic Plan, remove details regarding office ownership of SLP's, remove detailed office descriptions, add description of Office Execution Planning process (and the tie between that content and the Strategic Plan, including Outcomes serving as quality objectives), removal of GSFC and HQ org charts.	Sync the QM with the IV&V Program Strategic Plan (approved Sept. 2012) (addresses PAR # 2012-P-376), simplify the QM by removing content that isn't required and describes our organization in general (rather than describing our organization's implementation of a quality management system).	Jeffrey Northey	03/27/2013
Q	Modified Section 3.2 to clarify that Section 7.6 (of the ISO 9001:2008 Standard), <i>Control of monitoring and measuring equipment</i> , is excluded.	Equipment is not used by the IV&V Program to provide evidence of conformity of product to determined requirements. (PAR: 2014-P-396).	Jeffrey Northey	08/28/2014